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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LEVI, DAMEON E

ART UNIT

PAPER NUMBER

2841

DATE MAILED: 08/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/671,436

Applicant(s)

MATSUDA ET AL.

Examiner

Dameon E Levi

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7 is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Arledge et al US Patent 5436744.

Regarding claim 1, Arledge et al discloses a printed circuit board comprising:
a glass substrate provided with through-holes; conductive patterns provided on both surfaces of the glass substrate in such a manner as to be made conductive to each other via the through-holes; and a sealing member provided to fill the throughholes (for example, see elements 10,60,68 Figs 3-8 also see column 2, lines 60 – column 3, line 35)

Regarding claim 3, Arledge et al discloses wherein the sealing member is a conductive paste containing an epoxy resin as a binder(for example, see column 2, lines 60 – column 3, line 35)

Regarding claim 4, Arledge et al discloses wherein a conductive film is provided on an inner wall surface of each of the through-holes in such a manner as to connect the conductive patterns provided on both surfaces of the glass substrate to each other, and

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an inner space, inside the conductive film, of the through-hole is filled with the sealing member (for example, see elements 68, Figs 3-8, also see column 2, lines 60 – column 3, line 35)

Regarding claim 5, Arledge et al discloses wherein the sealing member is an epoxy resin (for example, see column 2, lines 60 – column 3, line 35)

Regarding claim 6, Arledge et al discloses wherein the surface of the sealing member exposed from each of the through-holes is covered with a metal film (for example, see elements 66, Figs 3-8)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arledge et al US Patent 5436744 in view of Yokono US Patent 5150005

Regarding claim 2, Arledge et al discloses the instant claimed invention except wherein the glass substrate is a no-alkali glass substrate.

Yokono discloses a no alkali glass substrate (for example, see element 14, figs 3,5, see column 2, lines 25-27)

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Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a no alkali glass substrate as taught by Yokono in the device as taught by Arledge et al as no alkali glass is used for substrates due to the low coefficient of linear expansion of such materials.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arledge et al US Patent 5436744 in view of Curcio US Patent 6452117

Regarding claim 8, Arledge et al discloses the instant claimed invention except wherein each of the conductive patterns has a stacked structure of an epoxy resin film and a copper film formed thereon

Curcio et al discloses an arrangement wherein each of the conductive patterns has a stacked structure of an epoxy resin film and a copper film formed thereon (for example, see elements 172,174, Fig 7H)

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a stacked structure of epoxy resin and copper as taught by Curcio et al in the circuit board as taught by Arledge et al et al for the purpose of usage as an interposer for facilitating the attachment of electronic components thereon

Claims 9-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arledge et al US Patent 5436744 in view of Stevens US Patent 6392356 in view of

Nakazawa et al US Patent 6411349 and further in view of Curcio et al US Patent 6452117

Regarding claim 9, Arledge et al discloses a device comprising:

- a printed wiring board including a glass substrate provided with through-holes, conductive patterns provided on both surfaces of the glass substrate in such a manner as to be made conductive to each other via the throughholes, and a first sealing member provided to fill the through-holes; (for example, see elements 10,60,68 Figs 3-8 also see column 2, lines 60 – column 3, line 35)

Stevens et al discloses a display device assembly comprising

- a display device provided on one surface of the printed wiring board in such a manner as to be connected to a conductive pattern provided on a one surface of a printed wiring board;(for example, see elements 30, Fig 3)
- a drive component for driving the display device, the drive component being disposed on the other surface of the printed wiring board in such a manner as to be connected to the conductive pattern provided on the other surface of the printed wiring board;(for example, see elements 70,72, Figs 1-3, see column 5, lines 5-25)
- a protective glass board disposed in such a manner as to face to the one surface of the printed wiring board;(for example, see element 12, Fig 3)

Nakazawa et al discloses a display device assembly wherein

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- a second sealing member provided in such a manner as to surround a display device while being in contact with a printed wiring board and a protective glass board (for example, see element 252, fig 12)

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have include the glass circuit board as taught by Arledge et al and to arrange the display device components as taught by Stevens for the purpose of achieving a denser array of driver components in order to increase pixel pitch in the display device and to add the second sealing member as taught by Nakazawa et al for the purpose vacuum sealing the assembly as a whole.

Regarding claim 10 Arledge et al, Stevens and Nakazawa et al disclose the instant claimed invention except wherein the glass substrate is a no-alkali glass substrate.

Yokono discloses a no alkali glass substrate (for example, see element 14, figs 3,5, see column 2, lines 25-27)

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a no alkali glass substrate as taught by Yokono in the device as taught by Arledge et al, Stevens, and Nakazawa et al as no alkali glass is used for substrates due to the low coefficient of linear expansion of such materials.

Regarding claim 11, Arledge et al discloses wherein the sealing member is a conductive paste containing an epoxy resin as a binder (for example, see column 2, lines 60 – column 3, line 35)

Regarding claim 12, Arledge et al, Stevens and Nakazawa et al disclose the instant claimed invention except wherein a conductive film is provided on an inner wall surface

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of each of the through-holes in such a manner as to connect the conductive patterns provided on both surfaces of the glass substrate to each other, and an inner space, inside the conductive film, of the through-hole is filled with a first sealing member.

Curcio et al discloses a printed circuit board wherein a conductive film is provided on an inner wall surface of each of the through-holes in such a manner as to connect the conductive patterns provided on both surfaces of the glass substrate to each other, and an inner space, inside the conductive film, of the through-hole is filled with the sealing member (for example, see 123, 162, Figs 7E-7H)

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a conductive film on an inner wall surface of the through holes as taught by Curcio et al in the printed circuit board of the display device as taught by Arledge et al et al, Stevens and Nakazawa et al for the purpose of providing electrical conduction from one side of the circuit board to the other side (see Curcio Figs 7E-7H)

Regarding claim 13, Arledge et al discloses wherein the sealing member is an epoxy resin (for example, see column 2, lines 60 – column 3, line 35)

Regarding claim 14, Arledge et al discloses wherein the surface of the sealing member exposed from each of the through-holes is covered with a metal film (for example, see elements 66, Figs 3-8)

Regarding claim 15, Arledge et al discloses a device comprising:

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- a printed wiring board including a glass substrate provided with through-holes, conductive patterns provided on both surfaces of the glass substrate in such a manner as to be made conductive to each other via the throughholes, and a first sealing member provided to fill the through-holes; (for example, see elements 10,60,68 Figs 3-8 also see column 2, lines 60 – column 3, line 35)

Stevens et al discloses a display device assembly comprising

- bumps provided on a conductive pattern provided on one surface of a printed wiring board; a protective glass board disposed in such a manner as to face to the one surface of the printed wiring board; a display device provided on the surface, facing to the printed wiring board, of the protective glass board in such a manner as to be connected to the bumps;(for example, see elements 60,12,30 Fig 3)
- a drive component for driving the display device, the drive component being disposed on the other surface of the printed wiring board in such a manner as to be connected to the conductive pattern provided on the other surface of the printed wiring board;(for example, see elements 70,72, Figs 1-3, see column 5, lines 5-25)

Nakazawa et al discloses a display device assembly wherein

a second sealing member is provided in such a manner as to surround a display device while being in contact with a printed wiring board and a protective glass board (for example, see element 252, fig 12)

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Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have include the glass circuit board as taught by Arledge et al and to arrange the display device components as taught by Stevens for the purpose of achieving a denser array of driver components in order to increase pixel pitch in the display device and to add the second sealing member as taught by Nakazawa et al for the purpose vacuum sealing the assembly as a whole.

Regarding claim 16 Arledge et al, Stevens and Nakazawa et al disclose the instant claimed invention except wherein the glass substrate is a no-alkali glass substrate.

Yokono discloses a no alkali glass substrate (for example, see element 14, figs 3,5, see column 2, lines 25-27)

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a no alkali glass substrate as taught by Yokono in the device as taught by Arledge et al, Stevens and Nakazawa et al as no alkali glass is used for substrates due to the low coefficient of linear expansion of such materials.

Regarding claim 17, Arledge et al discloses wherein the sealing member is a conductive paste containing an epoxy resin as a binder (for example, see column 2, lines 60 – column 3, line 35)

Regarding claim 18, Arledge et al, Stevens and Nakazawa et al disclose the instant claimed invention except wherein a conductive film is provided on an inner wall surface of each of the through-holes in such a manner as to connect the conductive patterns provided on both surfaces of the glass substrate to each other, and

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an inner space, inside the conductive film, of the through-hole is filled with the first sealing member.

Curcio et al discloses a printed circuit board wherein a conductive film is provided on an inner wall surface of through-holes in such a manner as to connect the conductive patterns provided on both surfaces of the glass substrate to each other, and an inner space, inside the conductive film, of the through-hole is filled with the sealing member (for example, see 123, 162, Figs 7E-7H)

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a conductive film on an inner wall surface of the through holes as taught by Curcio et al in the printed circuit board of the display device as taught by Arledge et al et al, Stevens and Nakazawa et al for the purpose of providing electrical conduction from one side of the circuit board to the other side (see Curcio Figs 7E-7H)

Regarding claim 19, Arledge et al discloses wherein the sealing member is an epoxy resin (for example, see column 2, lines 60 – column 3, line 35)

Regarding claim 20, Arledge et al discloses wherein the surface of the sealing member exposed from each of the through-holes is covered with a metal film (for example, see elements 66, Figs 3-8)

Allowable Subject Matter

Claim 7 is allowed.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dameon E Levi whose telephone number is (703) 305-0426. The examiner can normally be reached on Mon.-Fri. (9:00 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David S Martin can be reached on (703) 308-3121. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0058.

Dameon E Levi
Examiner
Art Unit 2841

DEL

A handwritten signature in black ink, appearing to read 'D. Martin', with a stylized, overlapping loop structure.

DAVID MARTIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800